

Appl. No. 10/000,229
Amdt. dated Dec. 22, 2003
Reply to Office Action of September 24, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A microelectronic device, comprising:
a microelectronic die having an active surface, a back surface, and at least one side;
said at least one microelectronic die side comprising at least one trench sidewall, at least
one lip and at least one channel sidewall, said at least one trench sidewall residing in a plane
substantially planar parallel to said at least one channel sidewall; and
a metallization layer disposed on said microelectronic die back surface and said at least
one trench sidewall.

Claim 2 (canceled).

Claim 3 (previously presented): The microelectronic device of claim 1, wherein said at
least one lip is substantially perpendicular to at least one of said at least one trench sidewall and
at least one channel sidewall.

Claim 4 (previously presented): The microelectronic device of claim 1, wherein said at
least one lip is substantially angled to at least one of said at least one trench sidewall and at least

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one channel sidewall.

Claim 5 (previously presented): The microelectronic device of claim 1, wherein said at least one lip is substantially curved to at least one of said at least one trench sidewall and at least one channel sidewall.

Claim 6 (original): The microelectronic device of claim 1, wherein said metallization layer is at least one metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel.

Claim 7 (original): A microelectronic device assembly, comprising:
a microelectronic die having an active surface, a back surface, and at least one side;
said at least one microelectronic die side comprising at least one trench sidewall, at least one lip, and at least one channel sidewall;
a metallization layer disposed on said microelectronic die back surface and said at least one trench sidewall; and
a heat dissipation device attached to said microelectronic die back surface with a thermal interface material.

Claim 8 (original): The microelectronic device assembly of claim 7, wherein said at least

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one trench sidewall is substantially planar to said at least one channel sidewall.

Claim 9 (original): The microelectronic device assembly of claim 8, wherein said at least one lip is substantially perpendicular to at least one of said at least one trench sidewall and at least one channel sidewall.

Claim 10 (original): The microelectronic device of claim 8, wherein said at least one lip is substantially angled to at least one of said at least one trench sidewall and at least one channel sidewall.

Claim 11 (original): The microelectronic device of claim 8, wherein said at least one lip is substantially curved to at least one of said at least one trench sidewall and at least one channel sidewall.

Claim 12 (original): The microelectronic device assembly of claim 7, wherein said metallization layer is at least one metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel.

Claim 13 (original): The microelectronic device assembly of claim 7, wherein said thermal interface material is selected from the group consisting of lead, tin, indium, silver,

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copper, and alloys thereof.

Claim 14 (original): The microelectronic device assembly of claim 7, wherein at least a portion of a fillet of said thermal interface material extend from said metallization layer on said microelectronic die trench sidewall to said heat dissipation device.

Claim 15 (withdrawn): A method of dicing a microelectronic device wafer, comprising:
providing a microelectronic device wafer comprising a semiconductor wafer having a back surface, said microelectronic device including at least two integrated circuit areas formed therein separated by at least one scribe street;
forming at least one trench opposing said at least one scribe street and extending from said semiconductor wafer back surface into said semiconductor wafer, wherein said trench comprises at least two sidewalls and a bottom portion;
forming a metallization layer on said semiconductor wafer back surface, said at least two trench sidewalls and said trench bottom portion; and
forming a channel within said at least one scribe street and extending through said interconnection layer, said semiconductor wafer, and said metallization layer in said trench bottom portion.

Claim 16 (Withdrawn): The method of claim 15, wherein providing said microelectronic

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further includes providing said microelectronic device wafer having an interconnection layer disposed on said active surface.

Claim 17 (Withdrawn): The method of claim 15, wherein forming said trench comprises forming at least one trench that is wider than said channel.

Claim 18 (Withdrawn): The method of claim 15, wherein forming said trench comprises forming said trench by a method selected from the group consisting of laser ablation, wet etching, dry etching, reactive ion etching, and cutting with a wafer saw.

Claim 19 (Withdrawn): The method of claim 15, wherein forming said metallization layer comprises depositing a layer of metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel.

Claim 20 (Withdrawn): A method of fabricating a microelectronic device assembly, comprising:

providing a microelectronic die having an active surface, a back surface, and at least one side, wherein said at least one microelectronic die side comprises at least one trench sidewall, at least one lip and at least one channel sidewall;

disposing a metallization layer on said microelectronic die back surface and said at least

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one trench sidewall; and

attaching a heat dissipation device to said microelectronic die back surface with a thermal interface material.

Claim 21 (Withdrawn): The method of claim 20, wherein disposing said metallization layer comprises disposing a metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel on said microelectronic die back surface.

Claim 22 (Withdrawn): The method of claim 20, wherein attaching said heat dissipation device comprises attaching said heat dissipation device with a thermal interface material selected from the group consisting of lead, tin, indium, silver, copper, and alloys thereof.

Claim 23 (Withdrawn): The method of claim 20, wherein attaching said heat dissipation device comprises attaching said heat dissipation device with said thermal interface material such that a portion of a fillet of said thermal interface material extends from said metallization layer on said trench sidewall to said heat dissipation device.

Claim 24 (Withdrawn): The method of claim 20, wherein providing said microelectronic die comprises:

providing a microelectronic device wafer comprising a semiconductor wafer having a

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back surface, said microelectronic device including at least two integrated circuit areas formed therein separated by at least one scribe street;

forming at least one trench opposing said at least one scribe street and extending from said semiconductor wafer back surface into said semiconductor wafer, wherein said trench comprises at least two sidewalls and a bottom portion;

forming a metallization layer on said semiconductor wafer back surface, said at least two trench sidewalls and said trench bottom portion; and

forming a channel within said at least one scribe street and extending through said interconnection layer, said semiconductor wafer, and said metallization layer in said trench bottom portion.

Claim 25 (Withdrawn): The method of claim 24, wherein providing said microelectronic die further includes providing said microelectronic device wafer having an interconnection layer disposed on said active surface.

Claim 26 (Withdrawn): The method of claim 24, wherein forming said trench comprising forming at least one trench which is wider than said channel.

Claim 27 (Withdrawn): The method of claim 24, wherein forming said trench comprises forming said trench by a method selected from the group consisting of laser ablation, wet

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etching, dry etching, reactive ion etching, and cutting with a wafer saw.

Claim 28 (Withdrawn): The method of claim 24, wherein forming said metallization layer comprises depositing a layer of metal selected from the group consisting of gold, silver, titanium, chromium, vanadium, tungsten, and nickel.